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11 August 1982

# Worldwide Report

NUCLEAR DEVELOPMENT AND PROLIFERATION

No. 156

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11 August 1982

**WORLDWIDE REPORT  
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AUSTRALIA

U.S. INSTALLATIONS DESCRIBED AS SOVIET NUCLEAR TARGETS

Perth THE WEST AUSTRALIAN in English 2 Jun 82 p 44

[Text]

CANBERRA: American installations in Australia were an attractive nuclear target for the Soviet Union, the head of the Strategic and Defence Studies Centre, Dr Robert O'Neill, said yesterday.

But he said he did not believe that the Soviet Union would be itching to strike Australia if a conflict started.

There were many other targets closer to likely conflict areas that the Soviet Union would have on its list.

An attack on Australia would be very risky because it would accelerate and broaden the conflict.

Dr O'Neill was giving evidence to an inquiry into Australia-U.S. relations. The inquiry is being held by a sub-committee on the Pacific basin of the joint foreign affairs and defence committee.

He said that the Anzus Pact was an important treaty and became even more important at times of intense confrontation between the two super powers.

It also helped to deter conflict in the Pacific and South-East Asia because it indicated continuing American interest in the region.

As well, it indicated that American support would be given if Australia thought that its security was being jeopardised.

But Dr O'Neill said that Anzus was essentially an Australian creation. He argued against proposals to revise the treaty.

**Agreement**

He said that it had not been easy to obtain U.S. agreement to the treaty.

Once it was opened up for renegotiation there might be an agreement much less satisfactory to Australia than the present document.

Asked if America would support Papua New Guinea in a conflict with Indonesia, even in a time of impending conflict between the superpowers, Dr O'Neill said that he could not imagine the U.S. tolerating aggression towards Papua New Guinea.

The U.S. would want to support PNG but might not be able to till the greater problem was cleared up.

In these circumstances, Australia would have to manage the situation as well as possible in the short term. The Americans would expect Australia to become involved long before they did.

Australia could handle it unless the Indonesians decided to make an all-out national effort.

Dr O'Neill said that, in the case of a serious threat to Australian security, it was very difficult to imagine the U.S. Congress being reluctant to provide support.

**Warmth**

This was because of the warmth of the relationship and the historical continuity of commitment that had gone on for 40 years.

"What I would be more concerned about

is not American political unwillingness to provide support but physical incapability if Australia's security was threatened at a time of high tension elsewhere," he said.

He said that the U.S. might not be able to divert any forces because of conflict in Europe, the Middle East or Asia. Australia would be left to maintain security in this part of the world.

But any potential aggressor would have this problem.

A Defence Department submission to the inquiry said that Australian defence policy emphasised the need for a self-reliant capacity.

The submission said the Anzus Treaty provided substantial grounds for confidence that, in the event of a fundamental threat to Australia's security, U.S. military support would be given.

The benefits of the

network of bilateral defence contacts established under Anzus were not available elsewhere on comparable terms or at all.

A significant element of the relationship was the operation in Australia of joint defence and defence-related facilities.

A sub-committee member, Mr Ken Fry (Lab., ACT), challenged an assertion in the submission that the joint defence facilities at Pine Gap and Narrungar were conducted with Australia's full knowledge and participation.

But Mr Ross Cottrill, the first assistant secretary of the Defence Department's strategic and international policy division, quoted a 1977 statement by the then Defence Minister, Mr Killen.

Mr Killen had said that Australia and America were both fully aware of the work done and how they operated.

CSO: 5100/7539

U.S. STUDY SHOWS AUSTRALIAN U-ENRICHMENT MAY BE IN ERROR

Canberra THE AUSTRALIAN in English 8 Jun 82 p 15

[Article by Nicholas Rothwell]

[Text]

AUSTRALIA may be proceeding down the wrong path to a multi-million-dollar nuclear fuel enrichment plant.

This has emerged from the recently-released annual report of the US Energy Research Advisory Board which predicted that laser enrichment would be more economical than the centrifuge enrichment process.

Many American critics of centrifuge technology have attacked the decision to even continue with the centrifuge research at all.

The US, a world leader in enrichment technology, is now set to concentrate on laser enrichment, a process ruled out of consideration by this country.

Australia's proposed enrichment facility, now under study by four resource development giants - CSR, Western Mining, Peko-Wallsend and BHP - will select either centrifuge enrichment or the "chemical exchange" process pioneered in Japan and France.

The choice of the technology could make a crucial difference to the international competitiveness of the Australian nuclear industry, since the costs of the different processes may vary considerably, and this may allow Australian suppliers to offer competitive uranium sales on a slack world market.

If uranium is enriched be-

fore sale, the value of the export from this country is immediately tripled, so the need for an enrichment plant to make the most of the huge reserves of uranium now being mined in the Northern Territory is evident in mining industry circles.

Australia has access to several types of enrichment technology:

- THE French centrifuge and chemical exchange Chemex processes.
- JAPAN'S centrifuge and chemical exchange methods.
- THE Dutch/British/German Urenco-Centec group's centrifuge technology.
- THE US commercial nuclear companies' centrifuge methods.

But the preliminary report of the Uranium Enrichment Group of Australia, the four-company consortium now carrying out a \$5 million pre-feasibility study into enrichment here, has ruled out the promising laser enrichment technology.

This is despite the fact that advanced experiments on laser separation of uranium types have been carried out for a number of years at the Australian Atomic Energy Commission's Lucas Heights research laboratories and at the University of New England.

The US Department of Energy, which operates almost half the nuclear power capacity of the world, has now selected laser enrichment as the chief process to succeed the expensive and old-fashioned diffusion process.

The US has offered Australia only its centrifuge technology, which is not yet commercially proven, but the new US demonstration enrichment plant will be a laser separation system developed by the Lawrence Livermore Laboratory in California.

The selection of the atomic vapor laser isotope separation process, chosen after a seven-month review by the US Government, involves subjecting a stream of uranium vapor to a series of fine-tuned lasers and to a magnetic field, thereby separating atoms of varying weights.

The US is already building a centrifuge pilot plant in Portsmouth, Ohio, and it is this plant that will test the technology on offer to Australia.

CSO: 5100/7539

ROXBY DOWNS URANIUM PROJECT DOOMED TO POLITICAL DEFEAT

Canberra THE AUSTRALIAN in English 11 Jun 82 p 11

[Article by Peter Blunden]

[Text]

THE last hope of averting an indefinite deferral of one of the nation's biggest resource projects, the Roxby Downs venture in South Australia, was shattered last night.

The joint venture developers of the mammoth uranium, copper and gold deposits rejected a proposed political compromise which would almost certainly have given the project the go-ahead.

The unyielding anti-uranium posture of the ALP and Australian Democrats in South Australia is now certain to sink the project in the State's Legislative Council next week.

The Labor Party had indicated its willingness to pass the crucial Roxby Downs Indenture Bill subject to seven amendments, but vowed to vote against the Bill if they were not accepted.

But Western Mining Corp and BP Australia said in a joint statement the amendments would "remove the security of tenure and certainty of regime which form the foundations of the Indenture Agreement".

Government sources have regarded the Roxby Downs

project as potentially one of the world's most significant.

Estimates have placed the value of in-ground commodities at Roxby Downs at \$80,000 million.

Already the joint venturers have poured millions of dollars into the project, and more than 600 people are employed on the site as a feasibility study continues.

But defeat of the Indenture Bill in its present form will place the project in mothballs and, as the State's Deputy Premier, Mr Goldsworthy, acknowledged last night, jeopardise the livelihood of the workers and their families.

Mr Goldsworthy, after examining the companies' response last night, said there was no hope of compromising on the amendments.

One proposal was especially unacceptable for the partners.

That proposal would have meant approval to proceed to exploitation of the project was reserved for the government of the day at a time when the joint venturers indicated a commitment to mining.

The proposals "do not represent a bankable proposition", the partners said.

CSO: 5100/7539

## VICTORIAN BAN ON NUCLEAR SHIPS STIRS BROAD CONTROVERSY

## Fraser Reaction

Melbourne THE AGE in English 8 Jun 82 pp 1, 3

[Article by Michelle Grattan]

[Text]

CANBERRA. — The Prime Minister, Mr Fraser, last night said the Federal Government might pass special legislation to override Victoria's new ban on nuclear-powered and nuclear-armed vessels visiting the State.

Mr Fraser said he was seeking urgent advice whether legislation might be necessary to ensure that the Federal Government could carry out its "constitutional responsibilities for the defence of Australia".

The Commonwealth had the ultimate constitutional power, Mr Fraser said. The Victorian Premier, Mr Cain, wrote to Mr Fraser on 27 May giving notice that his Government would not permit visits of nuclear-powered or nuclear-armed vessels to Victorian ports.

Last night Mr Fraser condemned Mr Cain's "unilateral statement" that his Government proposed legislation for the ban. "This could have grave and far-reaching implications for Australia's defence and its relationship with its allies," Mr Fraser said. The Prime Minister released a batch of correspondence between Mr Cain and himself on the Victorian move.

In his reply to Mr Cain on 3 June, Mr Fraser said: "Implementation of the policy set out in your letter would have the effect of excluding from Victorian ports all warships of the navies of the United States, the United Kingdom and France.

"In the past eight years there

have been over 500 visits to Australian ports by warships of our nuclear-capable friends and allies. You will see, from these numbers, that prohibition of entry by these vessels would cause serious damage to our relationships with those countries."

Mr Fraser said that nuclear-powered warships would continue to be an important component of the capability of the navy of Australia's "major alliance partner", the US. "Denial of access to Australian ports by these vessels would not accord with the ANZUS relationship," his letter said.

Nuclear weapon nations had a long-standing policy of not disclosing whether nuclear armaments were carried in a particular warship, or whether it was nuclear-powered, he said.

This policy was accepted by the former Labor Prime Minister, Mr Whitlam, he added.

"It is simply not possible to obtain from the Government of a nuclear-weapon State an assurance that no nuclear weapons are carried in a particular warship," Mr Fraser said.

"To do so would identify to potential enemies, over time, which warships are nuclear-armed and which are not."

Mr Fraser said that Australia must be a reliable partner to the US because of ANZUS obligations and to Britain because of traditional links. "In the discharge of our responsibilities, Australia must be able, at the very least, to provide ports and port facilities

for the replenishment and servicing of warships of those and other friendly nations," he said.

He appealed to Mr Cain to look again at the Victorian Government's policy.

Earlier yesterday, Mr Cain said that the State Government was studying whether Commonwealth defence requirements overrode its plans to make Victoria a no-nuclear-free State.

Mr Cain said the State Government was preparing a bill to ban all nuclear activities in Victoria.

This would ~~enforce~~ ban power stations, uranium mining, uranium enrichment plants and nuclear waste storage dumps.

He said the transport of nuclear materials in ships or planes would also not be permitted through Victoria. He said this applied to material owned by the US and every other country.

Procedures regulating the industrial and medical use of nuclear materials would be developed. Mr Cain said that Mr Fraser had also raised with him the question of Australia's treaty obligations. This was also being considered.

#### Total Nuclear-Free Plan

Brisbane THE COURIER-MAIL in English 8 Jun 82 p 10

[Text]

MELBOURNE.— The Victorian Government plans to introduce legislation into Parliament which will ensure the state is nuclear-free.

A Bill being prepared will ban nuclear power stations, uranium mining, enrichment plants, and store and dumping stations.

Nuclear armed or powered vessels will not be able to use Victorian ports.

The transport of nuclear materials throughout the state also will be banned.

The Premier, Mr Cain, said yesterday a committee had been working on the Bill for two weeks.

The committee included representatives of the Minerals and Energy, Transport, Federal Affairs and Conservation Departments and the Health Commission.

Mr Cain said the banning of major nuclear activity was a policy of the Victorian ALP.

"The exceptions will be the use of nuclear technology in the medical and scientific research

area," he said. "They are narrowly defined exceptions."

Mr Cain confirmed he had written to the Prime Minister, Mr Fraser, raising the matter of access to Victorian ports by nuclear armed or powered vessels.

He said a decision to ban nuclear ships was not confined to American vessels. It included shipping from all countries.

"The Prime Minister has written back pointing out certain treaty obligations and defence powers in relation to nuclear vessels, and after investigating these areas we will reply to the Prime Minister," Mr Cain said.

A spokesman for the US Embassy said yesterday the banning was a matter between the Victorian Government and the Federal Government.

The Opposition leader, Mr Thompson, called the decision on nuclear ships "sheer hypocrisy".

He said the decision had been forced on the government by the Socialist Left.

## Editorial Criticism

Canberra THE AUSTRALIAN in English 9 Jun 82 p 6

[Text]

THE Victorian Labor Government's intention to prohibit all activities involving the use of nuclear power has extraordinary implications for Australia as a whole. If Mr Cain is successful with what he proposes, a significant part of the conduct of our foreign relations will be taken out of the hands of the national government and our defence arrangements with our allies will be seriously affected.

Unbeknown to many of those who voted for him, Mr Cain is so committed to opposing the use of nuclear energy that he wishes to ban all "nuclear activities" within Victoria. This ban would go so far as to prevent the transport of nuclear materials in ships or planes through Victoria.

Mr Fraser tells us that Mr Cain is doing what he is told by the Socialist Left, which still looms large in the affairs of the Victorian ALP. Whether or not this is the explanation for the Premier's behavior, the effect of what he wishes to do would be to carry Australia a long way along the road to unilateral disarmament.

It is far from certain that any State has the constitutional power to do what the Victorian Government proposes. If it has that power and it carries out its present intention, the ability of ships from the American, British and French navies to come to Australia will be severely impeded.

All of these countries have vessels which are capable of carrying nuclear weapons. For compelling reasons of security, which the Prime Minister has referred to, none of these

navies announce in advance whether or not they are carrying them on any particular voyage. None of those ships would be able to dock in Victorian ports, nor would many of their aircraft, for similar reasons, be able to fly over Victoria or to land there.

The consequences for our defence arrangements and for treaties such as ANZUS are only too predictable.

Most Australians have given no indication that they wish this country to choose a policy of neutralism. Neutralism was not an issue in the recent Victorian elections, and, even if it had been, issues such as this should be settled nationally, not by those who are elected to look after the specific problems of their State.

Even among those most anxious to achieve an international agreement on nuclear weapons only a minority would favor a unilateral renunciation of the kind which Mr Cain hopes to impose on the whole of Australia. And the effects of his proposal would be nation-wide, as it would be absurd to tell our allies that they were banned from a significant section of this country's territory and its facilities.

While it is important for our security that Mr Cain abandons this ill-conceived embargo, it is even more important to discover where the Federal Labor Party stands. If Mr Hayden and his colleagues are in favor of such a dramatic change in what was a fundamentally bipartisan defence policy, the next federal election could be decided on issues a long way removed from interest rates and unemployment.

## Success of NSW Ban

Sydney THE SYDNEY MORNING HERALD in English 9 Jun 82 p 1

[Article by Paul Kelly]

[Text]

CANBERRA. — While the Prime Minister, Mr Fraser, is conducting a major political assault on the Victorian Premier, Mr Cain, for his plans to make Victoria a "nuclear-free" zone, the NSW Premier, Mr Wran, is continuing his six-year ban on nuclear-powered ships in Sydney Harbour.

The Prime Minister has listed the 44 occasions on which nuclear-powered ships have entered Australian ports since 1976 — but not one has been to Sydney.

In 1976, soon after coming to power, Mr Wran wrote to the US Consul in Sydney over a planned visit by the USS Truxtun, indicating he would prefer it if the warship avoided Sydney. As a result it went to the naval base on Commonwealth territory at Jervis Bay.

No US nuclear warship has sought entry to Sydney since then, although the Truxtun has made several visits to Melbourne and Brisbane.

Mr Cain's "nuclear-free" zone plan includes a ban on nuclear-powered ships and on ships carrying nuclear weapons.

But Mr Fraser's attack upon Mr Cain, who wants to back his stance with fresh State laws, appears to overlook the more low key opposition to nuclear-powered warships from NSW.

Government sources said yesterday the ban on nuclear-powered ships entering Australian ports was first imposed by the McMahon Government in 1971, pending an inquiry.

No such ships entered Australia until 1976 after the review was completed.

Since then there have been 44 visits by nuclear-powered ships to Australian ports. Of these 35 were to Western Australia, four to Melbourne, two to Tasmania and one each to Darwin, Brisbane and Jervis Bay.

Federal Cabinet examined Mr Cain's stance when it met at Darwin yesterday.

In an attack on the Victorian Government later, Mr Fraser said that Mr Cain was endangering ANZUS and "tearing up the traditions of Australia's defence and foreign policies."

The implications of the Victorian position were that there could be no more visits to Melbourne by the United States and United Kingdom navies making it "impossible for us to fulfil our obligations under ANZUS."

This was because nuclear weapon States "would not and could not" say to the world which ships were carrying nuclear weapons.

In other moves yesterday:

- The ALP leader, Mr Hayden, spoke to both Mr Cain and Mr Wran about Labor policy on nuclear warships.

- Mr Hayden later attacked the Prime Minister for having different policies on nuclear issues depending upon whether ships or planes were involved.

- The Prime Minister said the Federal Government had sought advice from its law officers and, if necessary, would introduce an amending bill into Parliament to overrule the Victorian Government.

- The leader of the Australian Democrats, Senator Chipp, said his party would support any such legislation. Such issues had to be decided by the Federal Government.

## Editorial on Alliance Issue

Sydney THE SYDNEY MORNING HERALD in English 9 Jun 82 p 1

[Text]

MR FRASER has lost no time in seeking to make political gain out of the Victorian Government's proposed legislation banning not only all activities related to nuclear energy but, as well, all nuclear-powered naval vessels and all vessels not specifically guaranteed to be free of nuclear weapons. The proposed ban certainly strikes at the heart of this country's ANZUS relations with the US, and we are left to wonder at Mr Cain's motives and those of Mr Hayden in supporting him. But whatever his motives — whether arising from genuine anti-nuclear conviction, or to soft-soap the anti-American left-wing of his party or the environmentalists, or all three — he has managed to present Mr Fraser with just the election issue a Liberal Prime Minister likes in difficult times — defence. No matter how disenchanted the electorate with Liberal Party policies or with Mr Fraser's leadership, the great bulk of the electorate will not tolerate statements or policies which may seem to put the US alliance at risk.

The proposal does raise awkward questions for the alliance. The US expects that its nuclear-powered ships should be able to visit Australian ports as part of the alliance in the same way as they visit the ports of its NATO allies. It also refuses to specify which of its naval vessels carries nuclear arms, simply because to do so over time would indicate to the USSR which of its vessels is nuclear-armed and which ones are not. Mr Whitlam knew this and accepted the situation. Why does not Mr Cain? Or does he regard his proposed ban as merely a gesture doomed to failure, about which he can say to his party's Left at a later date that he has done his best but failed? If he does think this way, he doesn't know Mr Fraser, who can exploit a good issue when he sees one; and is now unlikely to let him off the hook. Moreover, Mr Cain should know that, where his proposed legislation concerns defence, the Commonwealth has the constitutional power in defence matters and the appropriate legislation under which to use it in respect of Australian ports.

The power exists despite the extraordinary comedy provided in 1976 by Mr Wran's "ban" on the USS Truxton visiting Sydney Harbour. His ban in fact had no legal force. It succeeded only because the Commonwealth, deciding

that discretion was the better part of valour, preferred to avoid a fight. The irony of the situation is that at that time Truxton was able to visit Melbourne, where it was greeted by largely friendly crowds, but not Sydney. It was not the end of Truxton, however. It turned up in Brisbane last month for the 40th Coral Sea Battle anniversary celebrations, where it was welcomed by friendly crowds and four protesters — three in sailing boats and one in a canoe. The original furore over Truxton arose from trade-union pressures over environmental fears, which the Commonwealth Government did little to allay by way of sustained public information about the low risks of nuclear accident occurring on the part of nuclear-powered vessels.

There are now well over 100 nuclear-powered vessels that have operated extensively throughout the world's oceans for the past 21 years; and despite accidents, sinkings and collisions, almost entirely at sea, there have never been reports of measurable danger from radioactivity. In the case of the US and its allies, the most stringent safeguards are employed and the most rigorous testing undertaken during and after visits by US nuclear ships. The Australian Ionising Radiation Council puts the odds of nuclear disaster during the visit of a US nuclear-powered warship to an Australian port as 100 times less than the chances of Adelaide being visited by an earthquake of the magnitude that destroyed San Francisco.

Mr Hayden has gone to some lengths to draw attention to the contradiction, as he sees it, between the US agreement that the B52s staging through Darwin on Indian Ocean reconnaissance flights shall not be nuclear-armed and the fact that some of its ships using Australian ports are so armed. The distinction is largely illusory. The B52s are used precisely for their designated task — unarmed reconnaissance. Nuclear armament is not part of their intended function. But the real issue at stake is not the false distinction Mr Hayden makes in respect of US superbombers and nuclear-powered ships visiting Australia, or the risks of nuclear pollution from ships which exercise Mr Cain. The real issue is that Australia must take risks if it is to rely on the alliance in a very uncertain world.

## Sinclair Attack

Canberra THE AUSTRALIAN in English 10 Jun 82 p 1

[Text]

THE Minister for Defence, Mr Sinclair, accused the Labor Party yesterday of damaging Australia's defences and seeking a policy of neutralism.

At the same time, the Deputy Leader of the Opposition, Mr Lionel Bowen, told a disarmament conference that Australia should develop an independent foreign policy.

Their statements follow the move by Victoria's Labor Premier, Mr Cain, to make Victoria a nuclear-free State and to ban nuclear-powered or nuclear-armed ships from the State's waters.

Mr Sinclair, who is touring defence establishments around the country, told a National Country Party meeting in the Northern Territory town of Katherine that Mr Cain's action showed the ALP was heading towards a policy of non-alignment in defence and foreign affairs.

He condemned what he called the Cain Mutiny as having "enormously adverse consequences for the defence of Australia".

"Non-alignment would reduce our ability to play a role with our allies both in ANZUS and other international defence arrangements."

No ships from nuclear powers such as the US, Britain or France could visit Australian ports with this ban.

He said the timing of the Victorian Government's statement was most unfortunate, as the ANZUS ministerial meeting will be held in Canberra on June 20 and 21.

In Melbourne, Mr Bowen told an ACTU disarmament conference: "We should be clearly indicating an independent foreign policy.

"It's about time Australia had its own foreign policy and wasn't beholden to someone

else."

Mr Bowen said he supported the Victorian Government's move to make the State a nuclear-free zone. The conference also supported the Victorian Government.

Mr Bowen said the Prime Minister, Mr Fraser, would use the nuclear-free issue to blame the ALP for threatening its defence alliance with the US.

But, he added, public opinion would be against any move to ban US communications bases in this country.

A former head of the Department of Foreign Affairs, Mr Alan Renouf, told delegates that Mr Fraser was a leader of the hypocrisy surrounding world concern for nuclear arms limitation.

Mr Renouf said while there was a lot of talk about disarmament, many countries at the same time were boosting their defence spending and encouraging other countries to do the same.

The Seafarers Union and the Waterside Workers Federation both said they would black ban any nuclear ships which enter Australian ports.

Mr Cain said yesterday the US Government was advised of the Victorian Government anti-nuclear stance before Mr Fraser.

Mr Cain said he had told a senior American diplomat of his Government's opposition to nuclear material, which included a ban on nuclear-powered or nuclear-armed vessels in Victorian waters.

Mr Fraser has challenged Mr Cain over his stand by claiming that a ban on nuclear vessels conflicts with federal defence treaty powers.

He has accused Mr Cain of tearing up the ANZUS treaty.

Mr Cain has sought a legal opinion from the State Solicitor-General and was still awaiting that yesterday.

## Opposition Support for Ban

Melbourne THE AGE in English 10 Jun 82 p 3

[Article by Michelle Grattan]

[Text]

HOBART. — A Federal Labor Government would ban nuclear-armed vessels from entering Australian ports, the Federal Opposition Leader Mr Hayden, indicated yesterday.

This could mean in practice that under a Labor Government most US warships would be banned because nuclear states refuse to disclose which of their vessels carry nuclear weapons. Such an action would have important implications for the alliance between Australia and the United States.

Mr Hayden said yesterday that the Australian Government should apply the same rules to US ships as it did to American B-52 bombers.

The United States assured Australia last year that B-52s flying through Darwin would "carry no bombs." The Americans have undertaken to seek the agreement of the Australian Government if they wish to change the operational nature of these flights.

Mr Hayden told reporters in Hobart yesterday: "We would ask the US to adopt the same principles and practices as they have accepted in relation to the B-52s."

He said it would be totally undesirable for any parts of Australia to become nuclear arsenals or storage or transit points.

Asked whether he would be opposed to warships coming to Australia with nuclear weapons, Mr Hayden said: "That's right. Yet, it would be inconsistent with our policy, our attitude to the B-52s and, indeed, the Prime Minister's attitude (to B-52s)."

The Labor Party now appears to have three separate positions on visits by nuclear-powered and nuclear-armed vessels:

● Mr Hayden opposes visits by nuclear-armed ships, but is relaxed about nuclear-powered vessels which do not carry nuclear weapons. He insists that Australia should be told if a visiting vessel carries nuclear arms.

● The Victorian Premier, Mr Cain, opposes visits by nuclear-armed vessels and nuclear-powered vessels, even if the latter

do not carry nuclear arms.

● The New South Wales Premier, Mr Wran, has banned visits by nuclear-powered ships, but allows stops by conventionally-powered vessels without insisting on knowing that they do not carry nuclear weapons. — These developments had such visits this year.

Mr Hayden made it clear that a Labor Government, which he headed, would not defer to a State Labor Government on the question of nuclear-powered vessels if it felt the nation's defence interest was involved. He said Mr Cain had assured him that he would not be seeking to intrude into the area of Federal constitutional responsibility for defence powers.

Mr Hayden said that in 1976 the former Labor Leader, Mr Whitlam, had laid down Labor's policy on visits by US nuclear-powered ships. He said that that policy declared that provided the Americans accepted full liability and certain environmental safety conditions were met, the Labor Party would not oppose these ships visiting Australia. He said he supported this policy unless some new deficiencies were found in these criteria.

In other moves on the issue yesterday —

● A Federal Government inter-departmental committee has indicated that it would be ready by the end of the week to make a recommendation to Cabinet on legislation to put Canberra's defence powers "firmly and finally beyond doubt".

● Mr Cain said he had told a senior US official of the ALP position on nuclear-armed and nuclear-powered vessels several months ago. The official, the Assistant Secretary of State for East Asia/Pacific Affairs, Mr Broad, had appeared surprised but had accepted the Government's right to make the decision.

● An ACTU conference on disarmament said yesterday that the Victorian Government's decision was in the best interests of the welfare of the people and condemned "the paranoid outbursts of the Prime Minister in attacking the decision".

Federal Legislation Scheme

Canberra THE AUSTRALIAN in English 11 Jun 82 p 1

[Article by Ted Knez]

[Text]

THE Federal Government is to introduce legislation to override any bans imposed by the Victorian Labor Government on nuclear-powered or armed warships entering ports in the State.

The move follows reports that a federal Labor Government would bar warships carrying nuclear weapons from entering ports in Australia.

The Prime Minister, Mr Fraser, foreshadowed the legislation last night, and accused the Leader of the Federal Opposition, Mr Hayden, of "destroying" an important element of the bipartisan approach to defence.

This followed Mr Hayden's enunciation of Labor's policy that nuclear-armed warships would be banned from Australian ports by a future federal Labor Government.

The Prime Minister said this had "grave implications for Australia's defence".

Victoria's Premier, Mr Cain, announced earlier in the week that his State would declare a

nuclear-free State - a move which Mr Fraser immediately seized on as a potential election issue.

Mr Fraser said last night that after talks with the Attorney-General, Senator Durack, it was agreed that legislation would be introduced with the aim of asserting the Federal Government's power and authority over defence and foreign policy.

Mr Fraser said: "The assertion that there is no difference between nuclear-armed ships and nuclear-armed aircraft is a complete red herring."

"The Government has rightly said that aircraft carrying nuclear weapons would not be allowed to fly over, or stage through, Australia without our prior knowledge and agreement," Mr Fraser said.

"A B-52 taking off from Darwin is launching a specific mission from Australian soil.

"This is quite a different situation from that of ships which come into port for rest and replenishment after patrolling duties of many weeks or months."

CSO: 5100/7538

AUSTRALIA

BRIEFS

RADIOACTIVE SAND BAN--Fremantle waterside workers have banned the movement of radioactive monazite through the port. However, they have agreed to load a cargo now sitting on the wharf. The national president of the Waterside Workers' Federation, Mr J. Smith, said yesterday that the union wanted clarification of alleged dangers to workers handling the mineral sand. The union had told employers that it wanted a meeting of experts, employers, the Fremantle City Council and the Fremantle Port Authority to discuss the issue, he said. The ban would remain in force till then no matter how consignments were packaged or delivered. The workers wanted a definite statement on the issue from the Minister for Health, Mr Young. Last year mining operations at Eneabba and Capel exported more than \$4 million worth of the sand which is used in special alloys and electronics. [Text] [Perth THE WEST AUSTRALIAN in English 5 Jun 82 p 8]

CSO: 5100/7539

## UN DELEGATE MAKES NUCLEAR BAN PROPOSAL

New Delhi PATRIOT in English 3C Jun 82 p 3

[Text]

UNITED NATIONS, June 29 (AP)—India yesterday formally introduced a treaty for renunciation of nuclear weapons at the UN General Assembly's second special session on disarmament.

Indian delegate A P Venkateswaran, putting the proposal before the Assembly's 137-nation working committee, said its adoption would be 'one small but crucial step' towards meeting the goals of the UN charter—whose first stated purpose is to keep international peace.

The draft convention on the prohibition of the use of nuclear weapons, as the document is called, says countries who ratify the treaty 'solemnly undertake not to use or threaten to use nuclear weapons under any circumstances'.

The convention says that it is 'of unlimited duration', is open to all states for signature and ratification, and will come into force when 25 governments have ratified it, including 'the five nuclear weapon states'.

A ban on use or threat of use of nuclear weapons would not detract from the prohibition on use of other kinds of weapons, as some members seemed to believe Mr Venkateswaran said.

Observers said the remark was

directed at some western countries which argue that their nuclear weapon stockpiles help them counter-balance the east bloc's superior conventional weapon arsenals.

The delegations of Norway, Sweden, Belgium, the Soviet Union, the Netherlands and Sri Lanka also addressed the committee, which heard another Indian warning against man taking wars into space.

Mr Yash Pal, secretary general of the United Nations conference on peaceful uses of outer space to be held this year, said there was growing evidence that space might turn into a battleground.

Mr Pal suggested letting an international body handle data from reconnaissance satellites, and all nations share it, as one way of contributing to worldwide peace and mutual confidence.

Belgian Jacques Raeymaeckers, whose delegation had submitted a memorandum on the ban of chemical weapons, suggested establishing a global machinery to verify their non use in combat.

Soviet delegate Nikolai Blokhin whose government has denied an American allegation that it used chemical warfare in Afghanistan and elsewhere, called for a treaty banning chemical weapons.

CSO: 5100/7117

## PARTICIPATION IN REGIONAL NUCLEAR AGREEMENT TOLD

Bombay THE TIMES OF INDIA in English 3 Jul 82 p 5

[Article by S. Kumar]

[Text]

BOMBAY, July 2.

INDIA has reiterated its commitment to help the regional co-operation agreement (RCA) of the International Atomic Energy Agency in technical co-operation and transfer of technology in nuclear science, to wean the member-countries away from the lure of the developed nations.

Dr. Raja Ramanna, secretary to the department of atomic energy, participating in the tenth anniversary of the RCA at Kuala Lumpur last month, emphasised that the experience and expertise available in the developing countries of the region should be utilised for the conduct, execution and management of projects based on nuclear techniques.

Dr. Ramanna's participation in the conference, which coincided with the fourth meeting of the RCA working group experts, was also significant in the sense that he sought to dispel a notion, lately emerging among the RCA members, which tried to equate India with the developed countries in nuclear technology.

Australia, Bangladesh, India, Indonesia, Japan, Malaysia, Pakistan, the Philippines, Republic of Korea, Singapore, Sri Lanka, Thailand and Vietnam are the members of the RCA. Experts from these countries reviewed the progress of various research projects currently underway.

## JOINT PROJECT

One of these was the project on industrial applications of isotopes and radiation technology, jointly funded by the RCA and the United Nations Development Programme. The Bhabha Atomic Research Centre here has been called upon to assist in the

formulation and processing of the project proposals.

The RCA-UNDP project commenced in April this year in which India is participating both as a donor and a recipient country. As a donor, in the areas of tracer technology, medical supply sterilisation and nucleonic gauging, India will make available, for regional use, its expertise and facilities. To support industrial tracer technology transfer, the BARC will serve as a focal point and centre of excellences within the regional network.

Australia and Japan have agreed to contribute about 12 million dollars for the UNDP-RCA industrial project, which comprises many sub-projects in different countries. Ten RCA countries, including India, have also agreed to their participation and financial contribution to the project.

One of the sub-projects envisages the installation of a large-scale demonstration set of a nucleonic control system for steel manufacture at the Bokaro steel plant. The BARC scientists are helping in the selection of the advanced nucleonic system for thickness control of hot-rolled steel plates. The equipment is to be installed before the end of this year.

## MAJOR STEP

In the words of Dr. Ramanna, the RCA-UNDP project on industrial applications of isotopes "was the first major step towards achieving significant economic and social gains in the region through the application of nuclear techniques."

Reviewing the status of various RCA programmes in India, Dr. Ramanna told the working group of experts that an intensive programme on radiation preservation of food, particularly potato, onions, wheat and dried fish, had been completed and that clearance from the health ministry was being awaited for the products. The problem of consumer

acceptance of irradiated food, however, remained to be tackled and regional co-operation in this aspect should be considered.

In the field of radiation sterilisation of medical products, the ISOMED plant at the BARC has been sharing its know-how with the other participating countries, in a co-ordinated research programme. India has trained three persons from Malaysia and one each from Bangladesh and Indonesia, in this field.

Among other projects which came for review were improving domestic buffalo production, use of induced mutations for high-yielding grain legume production, semi-dwarf mutants for rice improvement and biogas from agricultural residues.

## NUCLEAR FUEL COMPLEX BEING 'STARVED OF URANIUM'

New Delhi PATRIOT in English 30 Jun 82 p 1

[Text] HYDERABAD, June 29 (UND)—The enriched uranium plant at the Nuclear Fuel Complex here will be rendered idle from February next unless further supplies of enriched uranium arrive or substitute fuel is found by then.

As it is, the plant has been working to only one-fifth of its capacity since last August.

NFC chief executive N Kondala Rao told UNI yesterday that 19 more assemblies of enriched uranium out of the 19.8 tonne consignment received from the United States in August 1980 were yet to be sent to Tarapur. Then

there were about nine tonnes of scrap material left over since the NFC's inception. This would last till February next.

After tidying up the scrap, the plant had to wait for a further consignment or the alternate fuel he said.

However Dr Rao said, the staff of the enriched uranium plant was not being kept idle. They were being utilized in the natural uranium plant.

Dr Rao said, the total production of the enriched and natural uranium was kept at the same level of about 90 tonnes and in 1974-82.

The policy was to produce more

and more natural uranium for the reactors.

He said the US Government had cleared two consignments of 19.8 tonnes of enriched uranium in 1980, but only one consignment had been received. Two other consignments were to be received under the contract but there had been a deadlock.

Prime Minister Indira Gandhi's visit to the United States next month might pave way for the supply.

Dr Rao said the under-utilised machinery could be utilised for processing natural uranium once a decision was taken.

CSO: 5100/7117

## EXECUTIVE TELLS PROSPECTS FOR TARAPUR PLANT

New Delhi PATRIOT in English 3 Jul 82 p 8

[Text] Hyderabad, July 2 (PTI). The Tarapur Atomic Power Plant, near Bombay, faces no threat of closure in the event of enriched uranium plant at the nuclear fuel complex (NPC) here being wound up according to deputy chief executive of the NPC, J V R Prasad Rao.

Mr Prasad Rao told PTI here today that Tarapur power plant would keep going for another three years when the fuel reserves would exhaust.

The closure of the enriched uranium plant will hardly affect the activity of the NPC as it is one of the 16 plants, he added.

The Rs one crore enriched uranium plant has been processing uranium hexafluoride received from the United States into uranium oxide pellets for the Tarapur plant exclusively.

Mr Rao said the NPC had received the last consignment of 19.8 tonnes of uranium from the US in August 1980. Besides, one consignment was cleared but not received and two more consignment were due as per the agreements.

He said the Tarapur power plant the first of its kind to be set up in the country, would continue to function for about three years without any hitch. He hoped by that time an alternative agreement would be made to keep the plant going.

Mr Rao said 'as the uranium supply dwindled we started recycling the residue which process may be completed by February next'.

Mr Rao said the enriched uranium plant of the NPC had about 3100 workers and most of them were shifted to natural uranium plants which were the main stay of the NPC.

He said the enriched uranium plant would be converted into the natural uranium plant in case no further supplies were received from the US.

CSO: S100/7120

## GANDHI REPORTS HEAVY WATER PLANTS TONED UP

Madras THE HINDU in English 3 Jul 82 p 9

[Text]

NEW DELHI, July 2.

Technical problems responsible for delays with the heavy water plants have been identified and are being rectified to raise production of this crucial nuclear material, the Prime Minister, Mrs. Indira Gandhi, said here today.

The Kota Heavy Water Plant would start producing reactor grade heavy water before the end of the year, she told the Consultative Committee of Parliament for the Departments of Space, Atomic Energy, Electronics, Science and Technology, Environment and Ocean Development.

Mrs. Gandhi said that target for heavy water production by March 1983 had been set at 80 tonnes including that from the Nengal Plant.

The current indigenous stock is 45 tonnes of freshly produced heavy water and 104 tonnes of unsegregated heavy water requiring upgrading before use in nuclear reactors, she said.

**Environment protection:** The Government was taking greater care to ensure protection of the environment from new industries and human settlements. She said she was meeting the representatives of the people of the hill regions that are threatened by deforestation.

The members were also informed that the Department of Electronics was taking effective steps to increase mass production of electronic goods and no delays were involved in giving approvals.

Within the last three months, as many as 350 applications for microprocessors and allied items were cleared and as of date no application was pending.

Regarding computer magnetic tapes, required for storing programmes etc., the MPs were told that the present demand for these tapes was between 60,000 to 70,000 reels of 2,400 ft each.

To conserve foreign exchange, efforts were being made to tie such imports with the transfer of technology for the manufacture of computer tapes in a phased manner by the Electronic Trade and Technical Development Corporation (ETTDC).

The ETTDC was setting up soon a cent per cent export production unit for magnetic heads in Punjab in collaboration with a U.S. firm. It was also exploring the possibilities of setting up hundred per cent export production units for items like digital watches and colour television sets in Uttar Pradesh, Orissa and Sikkim.

**Brain drain:** For tackling the problem of brain drain of scientists and technologists, the Prime Minister said that the focus should be to retain brilliant young scientists in India and encourage those settled abroad to come back. The expansion of job opportunities for technical and scientific manpower was also receiving attention.

Mrs. Gandhi said that she was trying to find ways to solve the problem of brain drain by talking to a cross section of people including young scientists and industrialists. — PTI and UNI.

CSO: 5100/7119

**EXPERTS STUDY PROBLEMS OF HEAVY WATER PLANTS**

New Delhi PATRIOT in English 9 Jul 82 p 2

[Text] Probes made by official agencies into the possible cause of breakdowns and low capacity utilisation of India's heavy water plants indicate that plant management sabotage as a possible factor is to be ruled out.

The capacity utilisation in the two heavy water plants at Baroda and Tunicorin has been quite low while there have been delays in the commissioning of other plants, giving rise to apprehensions about sabotage. If the installed capacity is taken into account, the capacity utilisation of the Baroda plant during 1981-82, the first sustained year of operation, comes to only 24.3 per cent.

For the Tunicorin plant, this capacity utilisation comes to 21.9 per cent. However, if the availability of gas from the ammonia plants and deuterium content therein are also taken into account, the capacity utilisation of the Baroda plant during 1981-82 would come to 35 per cent and that of the Tunicorin plant to 47 per cent.

But according to official sources these constraints are essentially due to technical problems in a new area of technology in which solutions have to be found only from our own experience as no back-up experience is available from abroad.

These sources say that the causes of technical problems in most cases have been identified and action is being taken to rectify the defects in design or hardware wherever they have been identified. The experience gained from the working of the Baroda and Tunicorin plants is being evaluated to see that same problems do not arise in the new plants. For example design changes are being incorporated in the Thal Vaishet plant to ensure that it does not face the same difficulties as the previous plants.

About the Kota plant, these sources say, the first stage of enrichment is now expected to be achieved during September 1982. If no unforeseen problems arise and adequate steam supply is available from RAPS, this plant will be able to produce reactor grade heavy water before the end of the year. So far as the Talcher plant is concerned, its performance will depend on the successful operation of the coal based fertiliser plant. This is so as the coal based fertiliser plants are new to this country and their technology is yet to be proved for sustained operations.

At the same time, it is pointed out, plans are also being made for upgrading the heavy water which escapes from the power reactors to reactor grade quality. This water escapes from the power reactors while they are being operated and it has been found that it can be upgraded by recycling it. There is at present about 100 tonnes of unsafeguarded downgraded heavy water at RAPS and other plants which requires to be upgraded before it can be used in reactors.

All this would help realise the aim of putting up a capacity 10,000 MWe of nuclear power by the turn of the century. The present installed nuclear power capacity of operating stations is 860 MWe. Another capacity of 1410 MWe is in various stages of construction and commissioning.

The Sixth Plan has provided for construction of a total of six additional reactors of 235 MWe each. Out of these, work has already commenced on two reactors. The Atomic Energy Department also proposed to construct in a phased manner a sufficient number of pressurised heavy water reactors of unit 500 MWe during the Seventh and the Eighth Five Year Plans.—IPA

CSO: 5100/7122

INDIA

BRIEFS

NUCLEAR PLANT LOCKOUT--Baroda, June 26 (UNI)--The management of the Atomic Energy Department's heavy water plant near here lifted its 20-day-old lockout today. Works Manager G Batra told UNI that almost all the employees resumed work. He said he could not say about when the actual production would be resumed. The management had declared a lockout on 6 June and the matter was then referred to the Gujarat High Court. An agreement was finally signed before a bench of the High Court on Thursday. [Text] [New Delhi PATRIOT in English 27 Jun 82 p 4]

HYDERABAD COMPLEX URANIUM PRODUCTION--Hyderabad, July 6--The Nuclear Fuel Complex here has decided to double its production of natural uranium from 180 tons to 200 tons a year in order to meet the requirement of nuclear power plants, reports PTI. The NFC expansion programme will be taken up in October when apart from the natural uranium unit, a few other units will also be expanded, according to a spokesman of the NFC. At present the NFC is supplying fuel to three power units--Kalpakkam (Tamil Nadu), Kota (Rajasthan), and Narora (Uttar Pradesh)--and will soon be supplying fuel to the Kakrapahar (Gujarat) plant, the spokesman said. The NFC is gearing up its production mainly because three more nuclear power plants are expected to come up during the Sixth Plan, the spokesman said. The NFC, which has already started production of stainless steel tubes and ball-bearing tubes, has been declared a commercial undertaking with effect from April. Last year, the NFC achieved its targeted production of fuel. [Text] [Calcutta THE STATESMAN in English 7 Jul 82 p 14]

CSO: S100/7121

ARGENTINA

SIGNIFICANCE OF URANIUM DEPOSIT FIND HIGHLIGHTED

Buenos Aires LA NACION in Spanish 28 Jun 82 p 6

[Text] The importance of uranium, the main ingredient required for the use of nuclear energy, has been demonstrated at length by experience in this field. For that reason, the news of the discovery of uranium in Mendoza by the CNEA [National Atomic Energy Commission] will certainly be well received. This uranium is located in the mountainous area of San Rafael; its size is believed to be at least as large as the uranium in the Sierra Pintada.

From the CNEA's viewpoint, this find emphasizes the CNEA's effectiveness both in direct exploration and in supervision. Furthermore, it is clear that the existence of this new uranium field will certainly increase the availability of uranium reserves, and make it possible to expand those activities which depend on the existence of this ore.

In terms of regional, or to be more precise, provincial interests, this find will certainly benefit various aspects of the province's economy, which will be stimulated by the mining operations. According to the explorations done to date, these reserves should increase the presently existing reserves by 25 percent.

We should also make it clear that this find will benefit the entire nation. It has become more and more clear that we must have our own reserves of uranium in order to make use of the most advanced technologies.

In summary, this find demonstrates once again the need for a national mining policy, since Argentina's subsoil has still not been explored on a level to match its promising potential.

7679  
CSO: 5100/2217

ARGENTINA

CASTRO MADERO ON CONTAMINATION OF SOUTH ATLANTIC

PY212119 Buenos Aires DYN in Spanish 1125 GMT 21 Jul 82

[Text] Buenos Aires, 21 Jul (DYN)--Carlos Castro Madero, chairman of the National Atomic Energy Commission (CNEA) has stated that there is no "threat of contamination of the South Atlantic," even if it were true that the British destroyer "Sheffield," sunk during the war for the Malvinas, was indeed carrying nuclear material as the news media had reported.

In a statement to a radio station Castro Madero said that he wanted to "bring tranquillity" to the people in light of recent reports concerning possible contamination of the waters of the South Atlantic with the nuclear material that the British destroyer sunk by the Argentine naval aviation in the course of one of the attacks on the British fleet during the conflict for the Malvinas, was allegedly carrying.

The destroyer, that caught fire after being hit by an "Exocet" missile launched from a super Entendard plane, was abandoned by the crew and sunk after drifting for several days.

After the conflict was over, news media reported that the ship carried nuclear material which could threaten the area with contamination.

Castro Madero explained that "even if" the "Sheffield" did indeed carry nuclear material, this posed "no threat because it has not exploded, which means that it was not fissioned material, that is, highly active radioactive material."

Should the news media reports be true, something on which the CNEA chairman avoided passing judgment, he believed that the material could be "a few kilograms of uranium or plutonium which would be so diluted in the ocean that there would be no danger of contamination for the South Atlantic.

Asked about the feasibility study to build a nuclear-powered submarine in Argentina, Castro Madero said that it was a long-term project and that if it came true, it would take a long time.

CSO: 5100/2225

ARGENTINA

BRIEFS

NUCLEAR SUBMARINES--Salta, 23 Jul (TELAM)--Vice Adm Carlos Castro Madero, chairman of the National Atomic Energy Commission [CNEA], has stated that "the actions conducted by Great Britain during the Malvinas Islands operations force us to make changes in the philosophy governing the Argentine nuclear plan and to study the feasibility of building a nuclear submarine." He added: This is unfortunate because Argentina had intended to use its entire capability for peaceful purposes but the utilization by Great Britain of nuclear submarines, which precluded operations by our sea fleet, forced us into making this decision. The CNEA chairman, who is spending a brief vacation in Salta, told the newspaper EL TRIBUNO that the Argentine nuclear plan "is going well but we have funding problems because our budget is inadequate." Commenting on foreign technological support, he said: "We are still getting it from countries like Switzerland, Canada and Germany." He also denied the possibility of building a nuclear bomb in our country. [Buenos Aires NOTICIAS ARGENTINAS in Spanish at 1445 GMT on 23 July quotes Castro Madero as saying that construction of a nuclear submarine "will take from 8 to 10 years."] [Text] [FY231540 Buenos Aires TELAM in Spanish 1358 GMT 23 Jul 82]

CSO: 5100/2225

SOUTH AFRICA

KOEBERG FIRE AROUSES PUBLIC SAFETY FEARS

Johannesburg THE CITIZEN in English 23 Jul 82 p 10

[Text]

CAPE TOWN.—With the recent breach of security at the Koeberg nuclear power-station site and now a potentially-hazardous fire in its electrical building, renewed assurances are being sought, concerning public safety when the plant — the first of its kind in South Africa — becomes operational in a few months.

The R1 801-million N-station, sited a lot closer to metropolitan Cape Town than many academics and other concerned people feel it should be, is scheduled to start feeding power into the national grid early next year.

Professor Arnold Abramovitz, acting chairman of the body of concerned citizens known as Koeberg Alert, said this week in a reference to the recent breach and now the fire at Koeberg:

"The public will want more than bland assurances that these things will not happen after the reactor has gone 'critical', when they could have incalculable health and safety consequences."

"The public will particularly want to be reassured that information on events of this kind will not be hushed up, but will in fact be volunteered in full — including a candid assessment of their implications for the safe operation of the plant."

Professor Abramovitz said it should be noted that Ecom, when asked in July 1979 whether a log would be kept of all incidents arising from the operation of the reactors at Koeberg, had replied that such a log would be kept "as a matter of routine" and that Cape Town City Council and the public would have access to the log on request.

"It is to be hoped," he added, "that these assurances will be faithfully implemented. Only this way can damaging rumour-mongering be obviated."

While assurances were being given by Ecom that the weekend fire damage at Koeberg was not as great as initially thought, questions were also being asked whether the fire was a result of a malfunction of supposed-

ly "fall-back" equipment at the plant, whether the "human element" was involved and why Ecom had waited a day before making a statement on the fire.

These and other questions are being asked against the background of mishaps at N-stations overseas, particularly the major accident which severely damaged Pennsylvania's Three Mile Island nuclear powerplant four years ago.

And with the recent revelation that the seemingly-inviolate seat of British royalty, Buckingham Palace, was broken into on several occasions by a casual intruder, who ended up having a cosy 10-minute chat with Queen Elizabeth in her bed-chamber, there have also been renewed calls for assurance on the security of Koeberg.

Three men who broke into the construction site at Koeberg in May, apparently after money, were at first said to have used false documents although it was subsequently stated in Parliament

that two of them worked for the contractor concerned and had permits to be in the area.

Reference is made to the safety aspects of the Koeberg project in a report prepared by the City Electrical Engineer, Mr D C Palser, which was tabled at a meeting of the City Council's Executive Committee.

The report, on a meeting between the Escom Regional Liaison Committee (Koeberg) and Escom representatives refers to the emergency planning procedures developed for the N-station by Escom, as outlined by the power station manager, Mr P M Seemark.

"It was stressed," the

report says, "that no emergency situation was envisaged which would require immediate evacuation in haste. People in contaminated areas would be evacuated in a controlled manner in small groups.

"Environmental survey vehicles, assisted by SADF helicopters, would be available to map the extent of any contamination."

Mr Palser says in his report that the committee's attention was also drawn to the fact that small amounts of radioactivity were released routinely under controlled conditions during normal operations of a nuclear power station.

"Such planned releases would be checked

continuously to ensure that they are well within safe limits set and enforced by the Atomic Energy Board."

In a reference to the Three Mile Island accident the report says the Koeberg design is "significantly different in certain respects" from the American N-station and that "a number of the recommendations flowing from the inquiry into this accident have been incorporated into the Koeberg design, including additional civil works.

"From the way in which the meeting was conducted and from what was said by the various Escom speakers, it is clear that Escom is fully aware of the public's concern regarding safety." Sepa.

CSO: 5100/5687

SOUTH AFRICA

BRIEFS

BUILDING GUTTED AT KOEBERG--Cape Town--A fire swept through electrical circuits, causing hundreds of thousands of rands damage in a building next to the vault containing the reactor at the Koeberg Nuclear Power Station near Cape Town at the weekend. The fire, which broke out at 5 pm on Sunday, gutted the electrical auxiliary building of the power station before a specially equipped and trained Escom fire fighting team brought the blaze under control. Escom's regional manager in the Western Cape, Mr G.F. Hellstrom, said the fire destroyed electrical equipment worth "hundreds of thousands of rands" and would almost certainly affect the nuclear power station's switch-on date scheduled for the end of the year. "The fire has set the Koeberg programme back significantly," he said on Sunday. "We will only know by how much after we have finished sifting through the debris to determine the extent of the damage. The extent of the delay of the switch-on date will depend on the availability of spares." Mr Hellstrom said the fire broke out in the switch gear panel housed in the electrical auxiliary building--metres away from the reactor--at 5 pm on Sunday. A special fire fighting team that had completed a course in advanced fire fighting techniques last week quelled the blaze within an hour. Mr Hellstrom said that charred electrical equipment was being stripped to find the cause of the fire. No one was injured in the blaze. [Text] [Johannesburg THE CITIZEN in English 20 Jul 82 p 3]

NO SABOTAGE AT KOEBERG--An Escom spokesman yesterday denied claims by the military wing of the African National Congress that it was responsible for the recent fire at the Koeberg nuclear power station in the Western Cape. The claims were broadcast over Radio Ethiopia. The spokesman said in Johannesburg there was no hint of sabotage. The fire had been caused by an electrical fault.--Sapa [Text] [Johannesburg THE CITIZEN in English 22 Jul 82 p 11]

VRE STOPS AFL URANIUM--The depressed uranium market has prompted Vaal Reefs Exploration and Mining Company Limited (VRE) to suspend activities at the uranium mine belonging to Afrikander Lease Limited (AFL) which it mines in terms of a mineral lease. It has also been decided that the uranium section of the metallurgical plant will be placed on a care and maintenance basis after its scheduled completion in the current quarter. Investigations have subsequently been undertaken to determine the feasibility of exploiting available sources of gold-bearing ore from the old Afrikander mine belonging to AFL (not falling within the uranium mineral lease area) which could be treated through the gold section of the metallurgical plant to the benefit of both VRE and AFL. Subject to the necessary Government approvals, agreement in principle has now been reached between VRE and AFL for the mining by VRE of gold-bearing ore in an area of some 433 ha forming part of the old Afrikander mine. This ore which contains no recoverable uranium, will be treated in the gold section of the metallurgical plant. Ores reserves in the area to be mined are estimated to total approximately 1,4-million tons at an average gold recovery grade to 3,0 grams per ton. Treatment of this ore is planned to commence in the final quarter of 1982 at the rate of 15 000 tons a month, increasing in due course to 26 000 tons a month and therefore it is expected that the life of the operation will be approximately five and a half years. VRE is to finance the capital expenditure of the operation, estimated at approximately R4-million, as well as any operating losses incurred. [Text] [Johannesburg THE CITIZEN in English 23 Jul 82 p 20]

CSO: 5100/5687

REPORT ON EFFECTS OF NUCLEAR ATTACK ON NATION

Rome L'ESPRESSO in Italian 4 Jul 82 (Part I) and 18 Jul 82 (Part II)

[Article by Adriano Buzzati Traverso: "Italy, H-Hour"]

[4 Jul 82 pp 91-105]

[Text] Part I: Attack on the Center-South

L'ESPRESSO is devoting two special supplements to an issue that is ignored or "blocked out" by most Italians, and kept quiet by those few who are aware of it. The issue is an assessment -- based on a detailed scientific study -- of the effects of nuclear bombardment of several of our cities. And it is also designed to determine whether such an event is possible or probable, bearing in mind Italy's political and military position.

I have been studying these matters for some time, now, and I have continually been surprised at the widespread ignorance of the whole issue, even among men who hold high and responsible office. What is truly frightening, though, is the level of misinformation I have encountered among people who are otherwise educated and informed. So widespread is such ignorance that the most ridiculously misguided people can write about the issue. On 25 June 1980, I read an article in the French-language daily LE MONDE, entitled "A Weapon Against Subversion," signed by one Antoine Sanguinetti, a retired admiral. This gentleman, who described the so-called neutron bomb as "a gem of technology," asserted that it would make available to us in the West, pressed into service as policemen of the universe, an excellent means of stopping subversive infiltration or unusually hostile behavior in Africa or the Near East, without despoiling sources of vital raw materials.

Revolted at the admiral's cruelty and fatuousness, I wrote, for a newspaper to which I am a contributor, an angry article in which I held that criminal up for public opprobrium, and setting forth in no uncertain terms the monstrous effects of any nuclear weapon of whatever size. I subsequently received a number of letters from readers: some of them encouraged me to keep on telling the public about the horrors of any nuclear conflict; others clearly showed that they had not the slightest inkling of what such a conflict would mean everywhere, and in Italy in particular.

Since, for personal and professional reasons, I am aware of what could happen, I decided to conduct a study on the effects of a given number of nuclear explosions on targets in this country. So I turned to my friend Carlo Schaerf -- professor of physics at Rome University and an expert in the problems involved in wars of this kind -- to conduct my study with his help and making use of the data processing facilities available to him. "Friends of the Earth" provided the funds requisite for the research, which was assigned to Dr Madia Saponaro.

These two articles I have written for L'ESPRESSO show the conclusions we reached. A more complete and exhaustive report will be published in early September, in a small book entitled "Nuclear Death in Italy" which will be published by Vito Laterza.

In the illustrations appearing in these two issues of L'ESPRESSO you will find information on the possible destructive and lethal effects of nuclear explosions that might hit some of our cities and military targets. These effects were calculated on the basis of currently available data on the effects of nuclear bombardment. They are based on a study of the Hiroshima and Nagasaki disasters, as well as on another conducted during experimental nuclear explosions by the American armed forces in sparsely populated regions of the North American continent and on islands in the Pacific Ocean. Assuming that explosions of a given magnitude occur on the surface (as did the 2-megaton bombs in our study) or in the air (as did the one-megaton test in our study) over Italian targets, it is possible to calculate their consequences in terms of the number of inhabitants, their density, and their location in the city.

I feel it my duty, and that of everybody else in Italy who is aware of the possible consequences of a nuclear attack on our country, to make our fellow-citizens aware of what we know. To this end I have started -- along with many colleagues and friends -- the "Prevent Nuclear Annihilation" movement, also known as "PAN," to which readers may write for further information. The address is Via Barberini 29, (00187) - Rome. A.B.T.

The description of the probable effects of a nuclear attack on our country may seem superfluous to some ("it's such a horrible notion that no politician would be stupid enough to make it a reality") or sick and macabre to others ("there have always been prophets of gloom and doom, but they are nothing but sado-masochists and we really oughtn't pay any attention to them"). But the hard realities of the times we live in tell us that the risk of just such a catastrophe is mounting, the numbers of nuclear warheads are growing, as are the numbers of countries who have already built nuclear weapons or are just on the threshold of that nuclear capability.

According to the UN General Assembly report, published in September 1980, the United States has between 9,000 and 11,000 nuclear warheads with potential yields of 6,000 megatons; the USSR has between

6,000 and 7,500, with a potential yield of 9,000 megatons. This is the equivalent of 4 tons of high explosive, such as TNT (trinitrotoluene) for every man, woman, and child alive today. (A megaton, which means a million tons, is the equivalent of a million tons of TNT. A one-megaton bomb has eighty times the power of the bomb dropped on Hiroshima.

Furthermore, the complexity and sophistication of the nuclear weapons control systems -- developed over the past 10 years -- compound the risks, so as to make it altogether possible that a nuclear conflict might be set off by mistake.

Somebody has said that the threat of nuclear war has guaranteed peace in Europe for 35 years. The concept of "deterrence," in its simplest form, is based on the principle of "mutually assured destruction (or MAD, in the English acronym, which means crazy). This means that no superpower would dare launch an attack with nuclear weapons because each is aware that the adversary's response would be such as to wipe out the aggressor's own territory and a very large proportion of the people who live there.

In 1968 the then-Defense Secretary Robert McNamara, admitted that nuclear weapons with a yield of 200 to 400 megatons would destroy a third of the Soviet population and three quarters of that country's industry, and that this would therefore quite adequately meet the deterrence requirements. When the SALT I Treaty was signed, in 1972, the United States agreed to limit its nuclear forces to 1,618 intercontinental ballistic missiles and 740 submarine-launched ballistic missiles, and the Soviet Union agreed to similar limitations. Since then, however, missile performance has been greatly improved: now they can carry multiple warheads. The two great rivals developed this new technical advance at the same rate, without increasing the number of missiles, and hence without violating SALT I. Both sides, in addition, have bomber fleets capable of delivering nuclear weapons. At the same time, there has been vast proliferation of nuclear weapons with shorter range and smaller yield, which are not covered by the SALT I limitations.

The most alarming aspect of the latest developments, however, lies in the new designs shared by the general staffs of the two superpowers. Today, in fact, right here in Europe, both NATO and the Warsaw Pact have installed thousands and thousands of nuclear land mines, miniaturized nuclear artillery rounds, and short-range nuclear missiles. Current estimates put the number of military installations in Europe today equipped with nuclear weapons at 70 percent of the total. Should a war start in Europe, it is hard to believe that both sides would refrain from using nuclear weapons. Should this happen, the so-called "limited war" would swiftly escalate to the next phase: use of strategic weapons with a minimum yield of 1 megaton.

With this in mind, we confined our study to the effects of 1- or 2-megaton bombs falling on our cities or military targets: "tactical" nuclear weapons smaller than these, even if used in the initial phases of the conflict, would not substantially alter the outlook, since there would probably be swift escalation in 1-megaton nuclear weapons, or bigger, between the two adversaries.

Here, then, are some of the results of our study.

In or around the 40 Italian targets we considered (26 cities and 14 military bases) there are about 27 million people living today. If a 1-megaton bomb were exploded over each of these targets at a height of around 2,000 meters, the total number of deaths would be around 16 million, which works out to 59.50 percent. To these must be added the victims who would be more or less seriously hurt who did not die in the brief seconds of the explosion but were hit more or less hard by the shock wave, by falling buildings, by burns or by intense ionizing radiation.

If we assume instead that the enemy dropped the same number of 2-megaton bombs at ground level on those 40 targets, the mortality rate would rise to nearly 70 percent, which means that a little over 19 million people would die. Surface explosions blast out craters at ground zero (the point of explosion), which, for a bomb of the 2-megaton class measure 750 meters in diameter and anywhere from 250 to 300 meters in depth. A sizable portion of the tens of thousands of tons of soil would become radioactive, and that is what accounts for the higher overall mortality.

These cold figures, though, seem so absurd and unreal when we read them, and it is so far beyond the scope of our imagination to grasp the practical significance of the simultaneous death of millions of people, that we need a more detailed description of the destructive effect of nuclear weapons available right now by the tens of millions.

So let's take the case of Rome -- as the largest city in Italy -- and let's look at what would happen if a 1-megaton nuclear bomb were to explode downtown -- let's say that ground zero is Piazza Barberini. In the very instant of the explosion -- we cannot actually calculate how many millionths of a second it would take -- practically every building, every house, every monument, all the churches (every least trace of the city as we know it) would be gutted, flattened, reduced to a desert of rubble covering a circular area more than 6 miles in diameter all around ground zero. This means not just that the Quirinale and Viminale palaces, Piazza della Repubblica, all of Via Veneto, Piazza di Spagna, Montecitorio and Santi Apostoli, all of them relatively close to ground zero, would vanish: so would every other trace or landmark of the city and its history, like the Campidoglio, the Baths of Caracalla, the Vatican, Castel Sant'Angelo, the museum at Villa Giulia and, farther out, Monteverde, the Villa Doria Panphili, the Sacchetti pine grove,

Monte Mario, Vigna Clara, the Tufello, Monte Sacro, Pietralata, Portonaccio, Tor Pignattara, Cecilia Metella's tomb on the Old Appian Way, the EUR Exposition center, and St Paul's Without the Walls.

The shock wave that follows the explosion of a conventional blast gives rise to a momentary peak of pressure, but the shock wave from a powerful nuclear explosion lasts for several seconds and can surround and destroy whole buildings. It would pick up people along with everything else in its path, and carry them away bodily. Inside an area of more than 200 square kilometers, walls, roofs, and pavements, no matter what they were made of, would either be leveled or crushed, and the people and furniture inside them would be thrown out into the street.

Even farther away from ground zero, let's say 15 kilometers or so, fragments of glass and other lethal missiles would be hurled at deadly velocity in all directions by the shock wave. The physical destruction of buildings and houses would certainly kill thousands of people by sheer impact. The streets of Rome are narrow, so as to form bottlenecks bounded by the high walls of buildings. In a nuclear attack, the outside walls would crumble and the bottlenecks would fill up with rubble. People who happened to be inside the buildings would fall into the streets along with the rubble of the building, while those outside them would be buried and crushed by the avalanche of falling bodies and rubble.

At 3 kilometers remove from ground zero, the shock wave wind could reach 500 kilometers an hour, and still hit 300 an hour a couple of kilometers further out.

Meanwhile, the fireball would be swelling and rising; for 10 seconds it would hang there, roasting the city below it. Any human being caught in the open within a radius of 15 kilometers around ground zero would receive third-degree burns and would probably die of them; closer to the explosion, people would be broiled alive in a matter of seconds. The heat would be intense enough to melt metal and glass. Readily inflammable materials like newspapers or dry leaves would catch fire everywhere, starting blazes where they fell and triggering firestorms. The firestorms would make any shelter a deathtrap as the flames devoured the oxygen, and toxic fumes would asphyxiate anybody inside it. Furthermore, the extreme heat would penetrate so deeply into the earth as to turn the shelters into crematoria.

Like the victims of Hiroshima, the Romans would be burned, battered, crushed, and irradiated in every imaginable way. The city and its people would be mangled into a mass of slowly burning rubble.

The survivors, most of whom were at the outer fringes of the explosion, would be forced to abandon their own families to the flames, along with anybody else who had not managed to get away: the only

alternative would be to stay and die with them. A little later, while the ruins continued to burn, the procession of wounded and burned people would start trickling out, terror-stricken and in shock after their unimaginable experience, trudging slowly out of the devastated zone. Very few of them will succeed in getting away. In general, the greater the area of devastation, the slighter the chances of survival. When the target area is relatively small, as in the case of Hiroshima, people who can still walk and crawl may be able to reach a place of safety before the small fires rush together into a firestorm, from which there is no escape. But when the target area is as big as the one that would be hit by a 1-megaton bomb (which is around 80 times more powerful than the one dropped on Hiroshima), and fire breaks out everywhere within a 15-kilometer radius, and the streets are all but impassably choked with burning rubble, and the sky is so black as to be almost night, the chances that anybody at all could make it to safety become very slim indeed.

Even if we make no allowance for the lethal and sub-lethal effects of ionizing radiation from the explosion (we shall talk about them later on), what does "seeking safety" mean? The people who succeed in getting out of the danger zone will need water, food, and medical treatment for the injuries they may have sustained during their dreadful ordeal. But who will be there to help them and treat them? In all probability, there would be an exodus of survivors from the outlying areas around the disaster zone. And even if there were to be a few doctors left in the hospitals, they would be swamped in short order by the countless victims begging for help.

And now we come to the hideous and insoluble problems of the "post-bomb" period.

The first problem is radioactive fallout. We could conceive of it as a kind of poison that can be absorbed through the skin, lungs, stomach, and intestines. It is a poison that accumulates, meaning that it is absorbed and stored in the body. Once the accumulated dose exceeds a certain level, "radiation sickness" sets in, striking the bone marrow and other parts of the body. The first symptoms are nausea, vomiting, and diarrhea, followed by anemia, loss of head and body hair, impaired resistance to disease, possible skin irritation, and -- in the worst cases -- death. Thousands of people died of radiation sickness in the aftermath of the Hiroshima and Nagasaki explosions.

Radiation given off by a radioactive source, or by an element rendered radioactive as a result of events occurring in a radioactive cloud formed by a nuclear bomb, will fall out gradually as time goes by. And each radioactive element has its own specific half-life, which may range anywhere from seconds to millions of years. The term "half-life" is used to indicate that, once a given period of time has elapsed, half the radioactive atoms of a given element

will no longer be giving off radiation, because they will have undergone changes into other elements by reason of the radiation they have given off.

All material blasted from the land directly beneath a nuclear bomb explosion will form part of the fire zone at first, and subsequently of the radioactive mushroom cloud. Sooner or later, all this material will fall back to earth, massively contaminated with radioactivity. According to the amount and degree of soil contamination at a given place and time, the people who come into contact with it will be poisoned. If the radiation dose absorbed in this way is high -- say more than 600 rad -- a poison victim may die within the space of a few days.

The International Radiological Protection Commission sets 5 rad per year as the outside limit for exposure to ionizing radiation among people working in the radiation industries. Following a nuclear attack, people would almost certainly be subjected to doses far higher than that. A 1-megaton bomb would create a zone of 3,072 square kilometers which would go on sending out 2 rad per week for at least a year. In view of the fact that ionizing radiation causes not only the symptoms listed above for high and massive doses, but also increases the incidence of leukemia, bone cancer, lung cancer, thyroid cancer, breast cancer, and many more, the harmful effects of the nuclear explosion would persist for several decades after the event. Finally, the changes ionizing radiation induces in germ plasm -- the cells that produce eggs and spermatozoa -- can bring about hereditary birth defects which might remain recessive for several generations, then appear again long after the nuclear attack.

Another awful aspect of the "post-bomb" period has to do with impaired resistance to infection among those who have survived in spite of having received heavy doses of radiation. In the period immediately after the bombing, there will be hundreds of thousands of bodies lying on the ground or buried in the rubble, which nobody will be around to bury. Since flies, mosquitos, and other insects are far more resistant to ionizing radiation than are mammals in general and people in particular, these tiny beasts will find a huge and wholly unexpected grazing ground upon which they can multiply swiftly. As they merrily proliferate, the insects will turn into carriers of infectious germs which can trigger raging epidemics among the survivors, particularly in view of the fact that there will be no antibiotics or insecticides available.

Yet, above and beyond the medical and sanitation problems referred to so briefly here, there will be equally difficult problems at the social level. The limited availability of food and drink -- including water -- that is uncontaminated by radioactive fallout might well trigger violence among the survivors over access to these vital necessities of life. The same might happen over access to hospitals, houses, beds, and shelters, which the stronger survivors, or those in possession of firearms, will try to take over at the expense of

the weaker. A new law of the jungle might take over, against which only a military force could prevail sufficiently to restore a semblance of order. Any democratic guarantee of rights will thus be destined for oblivion, with the return of authoritarian patterns of government.

Finally, at the psychological level, the suffering, the loss of family and friends, the awareness that one is a carrier of organic or genetic taint, the lack of sufficient food, the continuing horror of scenes of widespread violence once even hope has fled, will inevitably drive a very great number of the survivors mad. A return to patterns of orderly life, the life they had enjoyed as a matter of course until just a few days ago, will look like an impossible dream, and rightly so. There will be no relatives or neighbors to turn to or to come to the rescue, no newspapers, no radio, no television: the survivors will have nothing to look at save a desolate and menacing landscape gazed at in horror, in the certain knowledge that they will never again be able to go back to a kind of life that is lost and gone forever.

Certainly these unfortunate wretches will not be capable of wondering "What for?" The very desire to go on living and thinking will be extinguished in their souls.

But we -- perhaps for a little time still -- can ask ourselves that question and demand an answer. The monstrous catastrophe that awaits us, if we do not set about preventing it right now, would be man's doing, not the work of some unknown, bloodthirsty power. Since we will be responsible for it, we can and we must prevent and thus ward off nuclear annihilation. People, every single one of us, all our fellow-citizens must be informed of the horrors that lurk behind such weasel-words as "balance of power," "deterrence," "flexible response," "limited war," "tactical nuclear weapons," and all the other tranquilizers the powerful are trying to make us swallow like good little boys and girls. We have to inform everybody, in the schools, in the factories, and out in the country, using written materials, illustrations, radio broadcasts, and TV documentaries, about what nuclear war really means.

Of course it is not enough to spread fear, anxiety, and terror: at the same time we must show the people that there are indeed viable alternatives to nuclear war, that there are things individuals and groups can do to prevent it. All of us must raise our united voice in overwhelming opposition to the so-called strategic and tactical doctrine generally accepted nowadays by military general staffs and governments alike, even though governments are even now every bit as blissfully ignorant of the true nature of nuclear war as are their fellow-citizens. This does not mean that we must grovel before a potential aggressor: what it does mean is that we must insure our own security without recourse to the diabolical weapons that would lead to the destruction and death of any nation, any people, any culture that would be forever annihilated in the name of security.

How are we to achieve this? We must think about it deeply, and at length: then we must act. The signs and portents of the redemption of all humanity without distinction are all about us: tomorrow, we must make these still unutterable aspirations a reality, and a victorious reality.

[ Boxed items ]

Comiso: Maximum Risk Zone

The area around Comiso has been included in all scenarios for the Apocalypse because, with the imminent deployment of 114 cruise missiles in this Sicilian commune, the area -- not to mention all of Southeastern Sicily, will become a prime target for the hypothetical nuclear aggressor. A nuclear attack on the Comiso missile base would kill 594,000 Sicilians, or 94 percent of the people who live in the area. The fallout from the radioactive mushroom cloud (estimated diameter: 20 kilometers for a 2-megaton bomb), made up of fine dust particles created by the explosion, would first make its deadly way over villages and countryside, then float out to sea in the direction of the prevailing winds.

Rome: Two Megatons on the Quirinale

A two-megaton bomb exploding at ground level in Piazza Barberini in Rome would, with its shock wave alone, utterly destroy all buildings, all monuments, and every trace of the city as we know it now within a radius of more than 6 kilometers around ground zero. More specifically, anywhere within the yellow circle on our map [not shown] there would be total elimination of life and property; anywhere inside the pale yellow circle, every human life would be snuffed out, and buildings would be almost totally destroyed; inside the light green circle, 14 kilometers away from ground zero, anybody in the open when the explosion occurred would sustain third-degree burns. People inside the dark-green circle would be exposed to radiation doses in sub-lethal amounts, while fallout (red line) would begin its death-dealing drift to the east. Total fatalities: 3.7 million, or 90 percent of the population of Rome.

Naples: A Crater at the Foot of Mt Vesuvius

A two-megaton bomb exploding in the heart of Naples would blast a crater at the point of detonation -- ground zero -- 750 meters across and 350 meters deep. As the map [not shown] shows, all buildings and people inside the yellow circle would be wiped out, while at a somewhat greater distance -- some 6 kilometers from ground zero -- there would be no hope for people, but some of the buildings would still be standing. One of the most fearsome effects of nuclear explosions is the tremendous amount of heat they generate: any Neapolitan inside the darkgreen circle (15 kilometers or so from ground zero) would be exposed to very severe burns.

Radiation, instantly lethal in the areas closest to the blast, would cause death in a matter of days or weeks in most people who happened to be inside the dark green circle. In all, of Naples' 4.9 million citizens, 4.3 million would be dead -- 87 percent of its total population. Survivors would number barely 666,000.

Bari -- Target: San Nicola

In Bari, the explosion of a two-megaton bomb over the city's core would cause 620,000 deaths in a total population of 767,000. The survivors, fewer than 150,000, would be wandering in a daze through a city no longer recognizable. The key we have used up to now (red dot for the point of impact, yellow circle for the area of total destruction, light green circle for the area of partial destruction of buildings and total annihilation of people, dark green circle for the area of severe burns, bottle-green circle, destruction and mild radiation, while the red mark indicates the boundaries of the area that would get most of the radioactive fallout), on our map [not shown] indicates the zones that would feel maximum impact from the nuclear attack.

Our H-Bombs' Ancestors

	Hiroshima	Nagasaki
Day and hour of explosion:	6/8/45, 0816	9/8/45: 1102
Bomb yield:	12.5 kilotons (12,500 t/TNT)	22 kilotons (22,000 t/TNT)
Distance of blast above ground:	5,000 m.	4,920 m.
Population of cities:	350,000	280,000
Dead as of 31/12/1945:	140,000	74,000
Devastated area:	13 sq. km.	6.7 sq. km.
Buildings in each city:	76,000	51,000
Buildings destroyed:	51,000 (68%)	12,750 (25%)
Buildings damaged:	18,240 (24%)	5,610 (11%)

Comparison with the explosions at Hiroshima and Nagasaki help us to grasp what would happen if a city of 4 to 5 million people were hit by a two-megaton bomb (160 times as powerful as the Hiroshima bomb). One- or two-megaton bombs are the so-called "strategic weapons" now armed and ready in the arsenals of the superpowers.

The maps of Italy are the work of publisher Mario Ambrico di Matera, after drawings by Paolo Gravina. Illustrations for both these supplements are the work of Virginia Arati and Sandra Marziali.

[18 July 1982]

[Text] Part II: Attack on the North

Italy is a member of NATO. On our territory we have more than a thousand nuclear missiles consigned to the American military. Only they can -- if deemed necessary by the high commands -- launch those nuclear bombs and make them explode on a potential enemy.

NATO strategic doctrine provides that in the event of attack by the armed forces of the Warsaw Pact (USSR, Poland, Bulgaria, Romania, Czechoslovakia, and the German Democratic Republic) with tanks, armor, and other conventional weapons (without the use of nuclear weapons), our armed forces would oppose the invaders on a "flexible response" basis. This means that we, too, would defend ourselves in the initial stages only with conventional weapons; in the event that these should not suffice, however, we would move to the use of battlefield tactical nuclear weapons. Should this force the enemy to halt his advance, there would be a "limited" nuclear war. In case the invader moved in turn to the use of tactical nuclear weapons so as to be able to continue his advance, NATO would be forced to resort to strategic weapons.

This vision of a possible war in Europe is wholly outside the scope of reality -- as even the military experts and political authorities in the NATO countries now admit. Given the fact that in Western Europe right now there are thousands of missiles with nuclear warheads aimed at targets in Warsaw Pact territory (and vice versa), it is only reasonable to assume that the first concern of the invader would be to eliminate those missiles aimed at him, which would require the use of nuclear weapons powerful enough to destroy them before we had a chance to use them. In other words, our "flexible" response would lead inevitably and very swiftly to the use of nuclear weapons powerful enough to insure the destruction of even relatively distant targets. In short, strategic nuclear weapons -- of at least one-megaton power -- would be used in Europe, and Europe would be wiped out as a cultural, social, and political entity. According to the scenarios for possible nuclear wars in Europe recently presented at Cambridge, England, by Russian and Western experts, fully half the 670 million Europeans now living between the Atlantic and the Urals would die quickly after the bombings, and at least another 150 million would die in their aftermath.

Furthermore, as military arsenals on both sides continue to grow in numbers and accuracy, the chances for nuclear weapons launched and detonated "by mistake" grow, too: the nature of today's nuclear missile systems assumes that the behavior of men and of the weapons of war they have devised and built will be perfect. We are not perfect, though, and neither are the things we create: because this is true, there might well be circumstances in which a fearful instrument of destruction could be activated beyond the control of human reason. Once begun, general conflict would be inevitable.

For these reasons, we shall consider here only the possible consequences of strikes by one- and two-megaton bombs on Italian targets.

I am convinced, deeply convinced, that the gravest and most difficult problem all of us -- citizens without further distinctions, professional people, unionists, parties, Parliament and government -- must try to resolve with all possible speed is that of preventing the start of nuclear war anywhere, and most particularly in Europe. Unemployment, crises in state finances and in industrial production, public unrest...all must take secondary rank to the terrifying possibility of the deaths of tens of millions of people in Italy and of hundreds of millions all over Europe if it ever came to the use of nuclear weapons, be they tactical or strategic.

And yet, every day I meet people who are informed, intelligent, and well above the national average who are totally unaware of this. Why?

As in dealing with any complex problem, the reasons are manifold. Those who have been involved in scientific and medical work -- and have thought about the problem -- are aware of the inhuman dimensions of a possible nuclear conflict that would simply nullify Europe as a cultural and physical entity. Governments -- not only our own -- have been careful not to explain what a nuclear war would mean in actual fact, with the result that even those who ought to be best informed, such as members of Parliament, are ignorant of the fate that awaits us and, like so many silly sheep, obediently vote in favor of the deployment of new and powerful missiles on our territory without even knowing how many of them there are, what their range and yield are, and what the probable retaliation of the adversary would be. Not even the military are fully briefed on the latest features of nuclear weaponry or on the consequences of their use on the battlefield, against military installations, against industrial plants and against cities.

Then, too, there must be a sense of guilt among scientists, and particularly among physicists, and therefore they are trying now -- not very effectively, on the whole -- to make their fellow-citizens start thinking.

Besides, most Italians are convinced that the politicians never pay the slightest attention to their ideas, their hopes, or their fears. We do not have the findings of any surveys on this issue: but in West Germany (whose situation is not very unlike our own) 78 percent of the citizens are convinced that the politicians don't know what ordinary people are thinking; and among the younger age-groups, that conviction rises to 85 percent.

Lastly, as Albert Einstein said, "Mankind can survive only if it finds an entirely new mode of thinking" (such as abolition of national sovereignty and secrecy, I add). Changing the way we think

takes hard work, takes commitment, takes perseverance: this is why people would rather wrap themselves up in a lazy and cynical disinterest that may well lead us all into final annihilation.

There is no time to lose. Therefore I felt it my duty as a citizen aware of the monstrous fate that awaits us to devote some portion of my time to explain to people and make them understand what an extensive nuclear attack on our country could mean. This is why, as I mentioned in the first instalment, with the indispensable help of Carlo Schaerf, professor of physics at Rome University, I have calculated the consequences of nuclear attack on 26 cities and 14 military bases located in our country.

Nuclear bombs come in all shapes and sizes, but they are all so powerful as to be measured in terms of thousands of tons (kilotons) or in millions of tons (megatons) of TNT (TNT is the abbreviation for trinitrotoluene, the so-called conventional chemical explosive used extensively during World War II). It has been reckoned that over the course of that war, which lasted almost 5 years, 5 megatons of TNT were exploded. The nuclear bomb (mistakenly called atomic) that dropped on Hiroshima on 6 August 1945 had the power of 12.5 kilotons; the one dropped on Nagasaki was rated at 22 kilotons. Current practice applies the term "tactical" to "bombs" (or warheads, or shells) having a power rating on the order of kilotons (like those used in Japan); "medium" applies to those rated at 75 kilotons or more, but still in the kiloton range; and "strategic" is used for those rated at one or more megatons. (A two-megaton bomb has 160 times the power of the one dropped on Hiroshima. The biggest bomb to be experimentally tested was rated at 60 megatons: its energy was released in an infinitesimal fraction of a second, and it was equivalent to 12 times all the explosives used in World War II.

As a rule, an explosion consists of sudden release of energy within a limited space (the dimensions of the missile or of the container in which the charge is housed). This holds good either for a "high explosive" such as TNT, or for a nuclear explosion, even though the energy is produced in a very different way. The sudden release of energy causes a mighty increase in temperature and pressure (around the explosion), so great that all matter present is instantaneously converted into hot compressed gases. Since the gases are at high temperature and under high compression, they expand very rapidly and in so doing generate a pressure wave -- called a shock wave or detonation wave -- through the surrounding medium, be it air, water, or land. The peculiarity of the shock wave lies in the onset of a sudden rise in pressure along a front which shifts in a circular movement around the point of detonation (known as "ground zero"), and behind which the pressure gradually lessens. The shock wave is accompanied by a strong wind.

As for the destructive effects of the shock wave, nuclear weapons are not substantially different from conventional. Here, though, are the basic differences between the two types of explosions.

1. Nuclear explosions may be many thousands (or millions) of times more powerful than the largest conventional blasts.
2. To liberate a given amount of energy, the mass of a nuclear explosive is far smaller than that required with conventional explosives. Consequently, there is a smaller amount of material inside the bomb for transformation into hot compressed gases: this necessitates quite different mechanisms to generate the shock wave.
3. Temperatures reached in a nuclear explosion are far higher: in a conventional blast they reach only 5,000 degrees; in our case, we shall be dealing with temperatures at tens of millions of degrees. A great portion of the energy freed will thus be released in the form of thermal radiation.
4. The nuclear explosion is accompanied by highly penetrating and harmful invisible rays, which are called "initial nuclear radiation."
5. All matter remaining in the wake of a nuclear explosion that has been subjected to initial nuclear radiation will become radioactive itself, and will go on giving off penetrating radiation for what may be fairly long periods of time. This kind of radiation is called "residual nuclear radiation."

To get some idea, albeit in simplified form, of how a nuclear blast comes about, how the various forms of energy and radiation emerge, and what their effects are on inanimate objects and on human beings, we can describe the sequence of events during and immediately after the explosion.

The almost inconceivable temperatures generated by the explosion will instantly turn all matter into gases. Since the gases are, at the instant of explosion, confined in the space originally occupied by the charge, awesome pressures are built up. They are probably in the neighborhood of many million times our atmospheric pressure, running on the order of many millions of kilograms per square centimeter.

Within less than a millionth of a second after detonation, the extremely hot portions of the bomb still intact begin giving off huge amounts of energy, most of it in the form of invisible x-rays, which are absorbed into the first few meters of surrounding atmosphere. This leads to the formation of a spherical mass of air and gases, which is extremely hot and bright (incandescent), which makes up the "fireball." Its superficial brightness gradually diminishes but, after a thousandth of a second, the fireball from a one-megaton bomb may seem brighter than the sun. Immediately after its formation, the fireball begins to expand and devour the

surrounding air; at the same time, its temperature -- the source of its brightness -- begins to drop. The fireball then begins to rise like a hot-air balloon. Within 7/10 of a millisecond after detonation of a one-megaton bomb the highly radioactive fireball has reached a diameter of almost 150 meters, and goes on expanding to reach its maximum diameter (1,900 meters) within 10 seconds; it continues to rise at the rate of 80 to 120 meters per second. One minute later the fireball has cooled, and no longer gives off any light: it will then be some 7 kilometers above ground zero.

While the fireball is still glowing, its temperature at its core remains so high because all the materials in the bomb are in a gaseous state. As it cools down, the vapors condense to form a cloud that contains minute particles of solid residue of the bomb, and countless tiny drops of water precipitated from the captured ambient air. Meanwhile, the initial spheroid shape changes into a sort of doughnut, inside which a violent circular motion begins. This sucks up even more air and solid particles from the ground, thus generating a powerful upward draft. If the explosion has occurred close to the ground, a crater will appear -- 750 meters across and 250 meters deep for a two-megaton bomb -- and some of the material blasted out will fall back onto the rim of the crater, while the rest of it will be sucked up to form part of the radioactive cloud. Thousands of tons of matter of all sorts will be sucked up by the cloud, which, in the meanwhile, has taken on the well-known mushroom shape, and there be made radioactive. Later on this matter will fall back onto the ground surface, after traveling great distances with the prevailing winds. This is when the radioactive fall-out occurs.

The physical principles governing the properties of nuclear weapons as described just now consist of fission (splitting) of atoms of the chemical elements Uranium-235 or Plutonium-239. Fission is a process during which the nucleus of an atom absorbs a neutron freed by the radioactive decay of U-235 or Pu-239, and thereupon splits in two, freeing energy and other neutrons or unstable products of radioactive fission. This process is used in the so-called "atomic bomb," but the term is inappropriate in that the process takes place at the atomic nuclear level.

The explosive power of these weapons cannot, practically speaking, be pushed beyond certain limits. However, the temperatures generated in the explosion -- on the order of tens of millions of degrees -- are so high as to be able to trigger a fusion reaction, in which the heavy atomic forms of hydrogen -- deuterium and tritium -- come together to form helium, thus liberating even larger amounts of energy. This is the process the sun uses to generate its enormous heat, and it is also used in the hydrogen or H-bomb. There are practically no limits on the explosive potential of these weapons, which are often referred to as fission-fusion weapons. And finally, the bomb may be sheathed in Uranium-238, whose atoms are split by

by the high-energy neutrons released by the fusion reaction, so as to produce still more energy and enormous quantities of additional radioactivity.

Lastly, if we are truly to understand the hazards stemming from nuclear explosions -- we must say something about ionizing radiation.

All of us have been exposed to radiation of various types; the light we see is a radiation type known as electromagnetic; the heat we feel on our skins when we come near a fire is carried by radiation of the same type; and it is electromagnetic radiation, even though our senses cannot perceive it directly, that forms the radio waves that are transformed into sounds or images by our radios or TVs in our living-rooms; the same applies to the x-rays we get for examinations, and to the gamma rays used in treating certain diseases. The difference between these various kinds of electromagnetic radiation lies in their energy and wave-length: the wavelength is extremely short for gamma rays, a little bit longer for x-rays, longer still for visible light, longer again for thermal radiation, and extremely long -- on the order of a meter -- for radio waves.

In addition to these electromagnetic radiation forms, there are others -- called "corpuscular" -- which are given off by such radioactive elements as radium, uranium, etc.

Within this area we distinguish: alpha rays (or particles), consisting of nuclei of helium accelerated to speeds as high as tens of thousands of kilometers per second; beta rays or particles, which consist of electrons given off by radioactive elements; and accelerated neutrons, given off during the fission process.

This corpuscular radiation, like the electromagnetic radiation with its shorter wave-lengths, is very high in energy, meaning that it can penetrate our bodies without our being aware of it at the moment we are absorbing it. All these kinds of radiation are called "ionizing radiation," because in objects of low mean atomic weight -- like our bodies -- they produce ionization, meaning that they cause molecules to split into two electrically charged parts. Absorption of ionizing radiation by our body tissues and cells can lead to death or damage to cells and tissues, if the dose absorbed is big enough.

There you have it. The reader has what he needs to understand what nuclear war is, and to realize that such a war can be unleashed on our country.

[ Boxed Items ]

### Pordenone/ Santa Barbara Friulana

Pordenone is a quiet little agro-industrial town in Friuli that would have a good chance of standing on the sidelines of a nuclear conflict if the Aviano air base were not close by it. From it, in the event of war, the "strike missions" would take off in preventive or reprisal nuclear attacks on the countries of the East. Aviano, a bastion of NATO's alignment in the Southern Theater, and as a consequence Pordenone, only 13 kilometers away, would be in the very center of the apocalypse. Estimates say more than a million of its 1.2 inhabitants would be killed, which comes to 88 percent of the people in this Friuli town and its surrounding area.

### The Military Targets

Of the 40 targets Adriano Buzzati Traverso has discussed, we show the two most important military objectives: Aviano (Pordenone) and Comiso. However, there are a lot more military installations that could be targets of a nuclear attack in our country. Here is a list of some of the biggest: the air bases at Ghedi, near Brescia, and Rimini-Minimare, where the squadrons of nuclear-capable F-14s (meaning they can drop 1,500-kilo atomic bombs) are based; "Site Pluto," near Vicenza, a fortified hill where the American army keeps most of the nuclear weapons earmarked for the Italian chessboard; the island of Maddalena, which is the fueling and repair station for nuclear-propelled and missile-firing submarines operating in the Mediterranean; and then there is Camp Darby, close to Leghorn; and Bagnoli (Naples); and Sigonella (in Eastern Sicily)...

In all the Atlantic Alliance, Italy is second only to Germany in the number of nuclear bases. The maximum density of missile launch sites, nuclear artillery units, and interceptor systems is in the Northeast portion of the Po Valley, between Zelo and Portogruaro. At Ca' Bianca, just a few kilometers outside Chioggia and not far from Venice, there is a launch site for the Nike Hercules missiles that can deliver a kiloton warhead over 140 kilometers in flat trajectory or send the same warhead into high trajectory at 45 kilometers altitude. Half-hidden by the terrain, and surrounded by overgrown wasteland, the Veneto's atomic bases would be equally high-priority targets in case of a Warsaw Pact attack. The peasants working in the fields scarcely raise their eyes when, during the frequent exercises there, the olive-drab tips of Nike Hercules and Lance missiles rise out of their emplacements. That doesn't mean, though, that they are used to the glittering spectacle. "If a war comes," says one citizen of Zelo, "you'd better get out of here in a hurry." Right. Get out of there. But where to?

G.M.P.

### Milan/ Don't Look At It from Seregno...

If the bomb were to explode over the central railroad station, all concrete surfaces, all steel structures, all glass would melt as far away as Greco and Gorla on one side and the main basin at the port of Ticina on the other (yellow circle). Some few houses, but not one human being might be unharmed inside the light green ring (Bresso, Idroscalo), while within a 14-kilometer radius of ground zero, a two-megaton bomb would incinerate everything in the path of the fireball: Even the people of Rho, Monza, and Trezzano might receive third-degree burns (dark green circle). Further out (deep-green circle) anybody in Seregno who looked directly at the explosion might well be permanently blinded. The cloud of radioactive dust sucked up from ground zero would float off toward the east (Bergamo or Brescia according to the wind direction). Of the 6.9 souls in Greater Milan, 5.4 million would die -- 76 percent of the population.

### Genoa / When the Ships All Disappear...

In Genoa, the dead after a two-megaton explosion would number 1.7 million, or 68 percent of the resident population. Of the core city, the port, or the fairgrounds not a trace would remain, while sizable neighboring towns like Arenzano and Nervi would be inside the area of partial destruction (deep-green circle) and of fall-out (red circle). The fall-out from the radioactive cloud would drift eastward, and quickly reach Modena and Pistoia. The temperatures, 15- to 20,000 times as hot as the sun's surface, that would be built up around ground zero would vaporize all ships at anchor, while the shock wave -- the wall of compressed air hurtling away from ground zero, would totally demolish any buildings as far as 10 kilometers from ground zero and even beyond.

### Turin / 4 Million Wandering Ghosts

What would become of Mole Antonelliana, of the Valentino park, of the city's 6 million people? In case of an attack with a two-megaton bomb, not a trace of what makes Turin Turin today would remain to show where it stood, not even the 2.2 million survivors who would be wandering like lost souls in a desert of rubble and tears. Who would bury the millions of dead? Who would care for the wounded, tend the ghastly burn victims, stay by those who are dying slowly of radiation sickness? Nuclear war is readying many scenarios for us, that only the sick fantasies of bloodthirsty strategists can possibly comprehend.

## From World War I to World War III

A comparison of the Italians who died in the last two major wars with the possible victims of a nuclear attack on Italy with strategic weapons.

1. World War I: 652,000 dead.
2. World War II: 300,000 dead.
3. In the event of a nuclear attack using 1- and 2-megaton bombs on the major Italian military bases and on only four of our biggest cities (such as Rome, Milan, Turin, and Naples), estimates show the number of victims at around 8 to 10 million. (The Buzzati-Schaert study covers a larger number of targets, and comes out at almost 20 million dead).

## How the Atomic Mushrooms Grow

In the figure [not shown] you see at once the difference in power between the early nuclear bombs and the ones we have today.

1. The Hiroshima bomb: 12.5 kilotons, the equivalent of 12,500 tons of TNT.
2. The Nagasaki bomb: 22 kilotons, the equivalent of 22,000 tons of TNT.
3. The smallest of the strategic nuclear bombs available in the superpowers' arsenals today: 1 megaton, the equivalent of a million tons of TNT (about 80 times as powerful as the one dropped on Hiroshima).
4. The biggest of the nuclear devices exploded in Soviet tests: 60 megatons, the equivalent of 60 million tons of TNT (some 5,000 times more powerful than the Hiroshima bomb).

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